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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,476	08/26/2005	Robert Amin	TS952TUS	7519
23632	7590	04/10/2008		
SHELL OIL COMPANY P O BOX 2463 HOUSTON, TX 772522463			EXAMINER DOERRLER, WILLIAM CHARLES	
			ART UNIT	PAPER NUMBER
			3744	
			MAIL DATE	DELIVERY MODE
			04/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/525,476

Applicant(s)

AMIN, ROBERT

Examiner

William C. Doerrler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF 298)
Paper No(s)/Mail Date 2-24-2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,5,6,8,10,11,14,18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Cole et al (5,956,971).
Cole et al discloses a method for removing solid carbon dioxide (which is formed in tank 31) from cryogenic equipment (tank 31) comprising introducing a stream containing methane (through line 21) to the tank, where solid carbon dioxide is melted and removed as a liquid stream through line 12, the liquid containing carbon dioxide and ethane. The liquefied natural gas produced by the system is sent to tank 34. In regard to claim 5, separators 180 and 181 separate the carbon dioxide from the hydrocarbons. In regard to claim 8, it is noted that the stream entering through line 21 contains alkanes (methane and others).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,4,7,12,13,15-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al in view of Styring (4,246,015).

Cole et al discloses applicant's basic inventive concept, a solid carbon dioxide removal system for cryogenic equipment, substantially as claimed with the exception of forming an azeotropic mixture of ethane and carbon dioxide. Line 24 of column 1 of Styring states that such a mixture is commonly azeotropic. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Styring to modify the carbon dioxide removal system of Cole by forming an azeotropic mixture to produce a constant mixture passing through the system until it is desired to separate the mixture (with the control of a constant composition mixture being easier to control). In regard to claims 4,13,16 and 17, the separation of ethane and carbon dioxide is seen to work at any composition of mixture.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al in view of Apffel (4,861,360).

Cole et al discloses applicant's basic inventive concept, a solid carbon dioxide removal system for cryogenic equipment, substantially as claimed with the exception of returning separated liquid back to the separation tank to absorb more fluid. Line 200 of Apffel shows the return of solvent to an absorbing system is known in the art. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Apffel to modify the carbon dioxide removal system of Cole by returning

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regenerated solvent to an absorbing column to reduce the amount of solvent required to run the process.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Engdahl shows a system for removing solid carbon dioxide. Carter and Goddin show systems that use hydrocarbons to remove carbon dioxide from cryogenic systems. Wilding shows a cryogenic device with a carbon dioxide cleanup cycle. Haut et al and Valencia show carbon dioxide solidification systems which remove the carbon dioxide in a liquid mixture.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

William C Doerler
Primary Examiner
Art Unit 3744

WCD

/William C Doerler/
Primary Examiner, Art Unit 3744